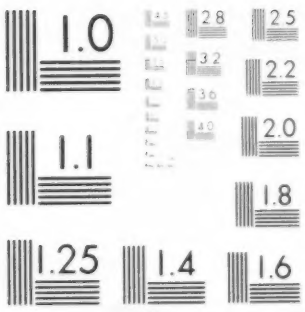

MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1961-A

DOCUMENT RESUME

ED 143 106 95 EA 009 819

AUTHOR Reese, Sandra C.; And Others
TITLE Behavioral Effects Within and Between Individual and Group Reinforcement Procedures.
INSTITUTION Institute for Behavioral Research, Silver Spring, Md.
SPONS AGENCY National Inst. of Mental Health (DHEW), Rockville, Md. Center for Studies of Crime and Delinquency.
PUB DATE Apr 77
GRANT MH14443; MH21950
NOTE 15p.; Paper presented at the Annual Meeting of the American Educational Research Association (New York, N.Y., April 4-8, 1977)

EDRS PRICE MF-$0.83 HC-$1.67 Plus Postage.
DESCRIPTORS Attendance; *Behavior Change; *Contingency Management; *Educational Research; *Interpersonal Competence; Junior High Schools; *Junior High School Students; Reinforcement; Remedial Programs; *Skills; Student Behavior; Suspension
IDENTIFIERS *Preparation through Responsive Educ Programs

ABSTRACT

This paper briefly outlines the outcomes of a large-scale behavioral program, Preparation through Responsive Educational Programs (PREP), involving students with academic and social deficits from a 1350-student junior high school. Overall program effectiveness was assessed by outcome criteria of total school grades, grades in non-PREP classes, school attendance, number of suspensions, and standardized test scores. The researchers discovered that the implementation of successive reinforcement system phases did not produce significant changes in either behavior ratings or class attendance. However, the overall results for the program year indicate that PREP was successful in promoting increases in school grades and attendance and in decreasing the amount of school suspensions for the experimental group of students. Only on the standardized tests did the PREP experimental students not show greater improvement than the control group. The researchers conclude that analyses of interactions between group and individual contingencies are necessary to understand the effects of behavior control. (Author)

****
* Documents acquired by ERIC include many informal unpublished *
* materials not available from other sources. ERIC makes every effort *
* to obtain the best copy available. Nevertheless, items of marginal *
* reproducibility are often encountered and this affects the quality *
* of the microfiche and hardcopy reproductions ERIC makes available *
* via the ERIC Document Reproduction Service (EDRS). EDRS is not *
* responsible for the quality of the original document. Reproductions *
* supplied by EDRS are the best that can be made from the original. *
****

ED143106

U S DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

Behavioral Effects Within and Between Individual and Group Reinforcement Procedures

Sandra C. Reese, James Filipczak

Gary Bass, Sterling Fennell

Institute for Behavioral Research, Inc.
2429 Linden Lane
Silver Spring, Maryland 20910

This paper was prepared for presentation at the meeting of the American Educational Research Association, New York, April 1977. The views expressed herein are those of the authors and do not necessarily represent the views of any agency named here.

The activities described here were supported principally by research grants MH14443 and MH21950 through the Center for Studies of Crime and Delinquency, National Institute of Mental Health, awarded to the Institute for Behavioral Research, Inc. Other support was derived from cooperating school systems and school staff who were largely responsible for the success of the project. We thank both school and project staff for their invaluable assistance in helping to develop and implement the PREP program.

Sandra C. Reese is currently at St. Cloud State University, St. Cloud, Minnesota; and Gary Bass is a graduate student at the University of Michigan, Ann Arbor.

EA 009 819

Behavioral Effects Within and Between

Individual and Group Reinforcement Procedures

The number and variety of behavioral applications in the natural setting have recently shown a marked upswing. To be considered functional, all new programs in educational settings must be premised upon a high benefit to cost ratio. Thus, the major criteria of program effectiveness for many behaviorally-based procedures should include improvement in both school social behavior and academic skills. The results of behavioral programs are reported widely in the literature (see Klein, 1973; Thoresen, 1973; and Ramp & Semb, 1975, for reviews of strategies to modify school behavior). However, many programs report only their overall effectiveness, describing outcome measures over the term of a program or school year. Seldom are programs described in terms of both overall outcomes and assessments of programmatic manipulations that occur during the program year.

In addition, many successful individualized contingency programs are reported that focus on specific inappropriate school behaviors, both academic and social. Most individual programs are described according to the effectiveness of systematic manipulations of consequences. However, few programs are described noting the relationship and role of these individual programs within the context of the total academic program.

This paper briefly outlines the outcomes of a large-scale behavioral program in an educational setting. However, the major focus is upon the behavioral results obtained during the school year as a function of

schedule and consequent-variable changes within that year. Individual behavior change programs are also related to the general behavioral program.

The behavioral program, Preparation through Responsive Educational Programs (PREP), is a large-scale applied research project designed to improve in-school and out-of-school performance of adolescents with academic and/or social skill deficits. PREP has been conducted in urban, rural, and suburban public schools, using regular school personnel as teachers and using project staff as research managers and teacher trainers. Academic instruction in English language, reading, and mathematics is combined with training for social skills that are important for the student in school and community settings (see Cohen, Filipczak, Goren, Goding, Storm, Bishop, & Breiling, 1974; and Filipczak & Friedman, 1976, for a more detailed description of the PREP program).

This paper focuses on PREP's activities during a recent school year in a 1350-student junior high school located in the inner-city area of a large East Coast city, with a 100% black student body and a large percentage of low income and single-parent homes. Students were selected for the sample based on teacher recommendations and concrete school-based criteria during the previous school year. Students were matched on the basis of sex, age, and attendance during the prior school year. Each member of a matched pair was randomly assigned to the experimental or control group, yielding 15 seventh graders, 15 eighth graders, and 19 ninth graders in each group. Only the eighth and ninth grade students' data are used here, as it was not possible to make meaningful comparisons of change scores between grades six and seven.

The experimental students were enrolled in the research program (special PREP classes in English, math, and social skill training) for three class periods a day, with the remainder spent in normal school classes. The control students were enrolled in the regular school program. Overall program effectiveness was assessed comparing change scores for experimental and control students on measures such as school attendance, grades, standardized test scores, and the number of suspensions.

All three PREP classes yielded behavioral measures within a contingency system that provided the students with a range of reinforcing tangible and leisure-time activities. During the program year, systematic contingency manipulations were made within the behavioral program to assess their effects on student behavior. Measures used for such program manipulations included the number of students attending class, ratings received by the student for his/her behavior during class, and the number of academic assignments completed.

Four different manipulations of reinforcement type and delay were made during the program year:

Phase I: Tangible reinforcement (e.g., small candy bars, fruit drink, or other snack foods) was given immediately at the end of the class period, based on receiving at least 90% of the possible behavior rating points. Students also earned activity reinforcements (e.g., ping pong, dancing to records, etc.) once a week, based on at least 80% class attendance (across all three classes) for that week. No consequences were applied for completing a class assignment other than social reinforcement (principally

teacher praise and earned grades). Phase I continued for approximately eight school weeks.

Phase II: Tangible reinforcement for high behavior ratings and activity reinforcement for class attendance were both given at the end of the school week based on performance during that week. Tangible reinforcement was given at the end of each class period for each assignment that was completed during that class. Activity reinforcers were not used, but social reinforcement for completed work remained in effect. Phase II continued for approximately five weeks.

Phase III: The Phase II system remained in effect during Phase III. However, special tokens were dispensed by and at the discretion of the classroom teacher to students who had demonstrated improved behavioral performance for that class period. A maximum of three tokens were given for exceptional behavior in each class period. These tokens could be traded for tangible reinforcement at the end of the school day. Phase III continued for approximately eight school weeks.

Phase IV: Tokens were given for behavior rating, class attendance, and assignments completed. Tokens could be redeemed for a variety of tangible and activity reinforcers. Redemption was possible twice a week during the first two weeks of the phase and once a week during the remaining six weeks of Phase IV.

Individual behavioral programs were also developed for two types of students: (a) students who experienced difficulty in achieving the social and academic skill objectives set forth in the overall program,

and (b) students who consistently exceeded those standards. Short-term behavioral contracts with a duration ranging from one to eight weeks were developed for both types of students. Fulfillment of short-term contracts was consequated through a variety of tangible and activity reinforcers. Students who experienced extreme difficulty in the ongoing program and who had been unable to complete short-term (one-week) contracts were placed on individual ongoing contracts with tangible reinforcement available on a daily basis. A total of 25 short-term contracts were developed during the academic year, with approximately equal numbers developed during each of the general program's four phases. Five ongoing contracts were developed during Phase III of the program year that lasted for the remainder of the school year. These individual contracts focused on inappropriate behaviors such as school tardiness, being off-task in PREP classes, and behavior and attendance in the students' non-PREP classes. Contracts for outstanding students placed the student on a delay of reinforcement ranging from two to four times that of the general contingency program.

Results

Overall program effectiveness was assessed by outcome criteria of total school grades, grades in non-PREP classes, school attendance, number of suspensions, and standardized test scores.

Insert Table 1 about here

An analysis of covariance (using the prior school year's performance on the appropriate measure as the covariate) indicated that all eighth

and ninth grade PREP students, as compared to the matched control group, showed significant improvement in total grade point average ($p < .05$), non-PREP class grades ($p < .05$), and school attendance ($p < .05$). A significantly smaller proportion of eighth grade experimentals were suspended during the school year ($z = -1.52$, $p = .06$), and the total number of days absent due to suspensions was significantly less, $X^2(1) = 6.58$, $p < .02$, for ninth grade PREP students than for the controls. Academic skill gain over the year was assessed by an analysis of covariance on standardized test scores (with pre-test scores as the covariate), indicating no significant difference between PREP students and controls.

Data resulting from the manipulations of reinforcement activities indicate a number of substantial between- and within-phase differences. A repeated measures analysis of variance on class attendance indicated a significant difference by phase of reinforcement system, $F(3, 36) = 5.59$, $p < .01$. Attendance during Phase IV was found to be significantly lower ($p < .05$) than in Phase I, using a Neuman-Keuls procedure. No other significant differences in class attendance between phases were found.

The number of assignments completed by students in PREP classes was found to differ significantly across reinforcement phases ($p < .10$), again using a repeated measures analysis of variance. A Duncan Range test indicated that the number of assignments completed during Phase III was significantly higher than that completed in Phase I. No other differences between assignments completed by reinforcement phase were found to be significant.

Student in-class behavior ratings were compared across phases via repeated measures analysis of variance. No significant differences were obtained as a function of system phase changes ($F < 1$).

Figure 1 illustrates the percentage of class attendance, percentage of assignments completed, and mean class behavior rating during the first two weeks (pre) and the last two weeks (post) of each reinforcement system phase.

Insert Figure 1 about here

The number of assignments completed changed markedly within each of the four phases. Assessment of the difference between "end-of-prior phase and beginning-of-new phase" indicated that on the implementation of each phase the number of assignments decreased significantly ($p < .05$ for Phase II-III and III-IV; $p < .10$ for Phase I-II). The implementation of successive reinforcement system phases did not produce significant changes in either behavior ratings or class attendance.

The 25 short-term individual programs yielded a 68% rate of successful completions. Success here is defined as the student meeting the criteria specified for receiving reinforcement at the end of the contract period. A comparison was made of the assignments completed by students for whom contracts were written and those for whom they were not. This information showed that contract students completed the same percentage of assignments in Phase I, a greater (not significant) percentage in Phases II and III, and a lesser (not significant) percentage during Phase IV than students not on contracts.

Discussion

The overall results for this program year indicate that PREP was successful in promoting increases in school grades and attendance and decreasing the amount of school suspensions for its experimental group students. Therefore, PREP could be considered effective in improving academic (as measured by school grades) and social (as measured by suspensions and attendance) skill in school. However, on standardized tests, the PREP experimental group students did not show significantly greater improvement than the control group. This negative finding should be interpreted with caution (self-serving though that is), as standardized testing procedures are not familiar parts of the school program to these students and the results may be influenced by more than student abilities.

The analysis of data within reinforcement phases indicated that the changes in contingency systems yielded differential effects on in-class criterion measures. Attendance decreased during every phase. The overall decrease in attendance from Phase I to Phase IV is also associated with a general decline in attendance across the school year. Yet, during every reinforcement phase, the number of classwork assignments completed increased. The class behavior ratings increased during two phases and decreased comparably during two phases. Implementation of any new system, therefore, seemed to yield a substantial increase in work rate (number of assignments completed), while behavior ratings and class attendance remained unaffected. The decrease in work rate from the end of Phase I to the beginning of Phase II is particularly surprising in that a contingency was <u>added</u> to the reinforcement program

in Phase II specifically to promote work rate. These differential effects observed within and across the four reinforcement phases underscore the importance of using multiple-criterion measures for determining program effectiveness. They also provide a note of caution for practitioners who attempt systematic program manipulations with reinforcement variables. Although students did not seem to attend class less often or misbehave more as a function of reinforcement changes, student work output in class was decremented initially, despite a perceived strengthening of the reinforcement applicable to this behavior.

The number and variety of systematic individual behavior programs conducted during this year was greater than had ever been attempted in this site before. However, the rate of successful contract completion appears (for lack of comparative possibilities) to be lower than should be possible. This low success rate was principally a function of five students who were placed on several successive contracts that focused on the same behavioral problem, thereby helping to insure a lower probability of overall success. For example, one student who did not satisfactorily complete a contract was placed on a second within one week; two students were placed on three different contracts (focusing on the same behavior) before successful completion.

An analysis of in-class data from contract versus non-contract students showed that these contracts detracted from, enhanced markedly, or had no effect on total group performance during the various contingency phases. During Phases II and III, students who were on individual contracts accounted for a portion of the increase in completed assignments. This is noteworthy in that the amount of work completed was never a

focus of any individual contract during that phase. Most contracts focused specifically on class attendance and appropriate behavior in non-PREP classes.

Illustrations of such multiple interactions among group and individual program systems appear more necessary as the number of behavioral programs increase. Such analyses can provide an important link in the chain of assessments needed to understand the effects of behavior control and counter-control in schools. A clearer understanding of these effects is demanded before the behavioral researcher can provide sound empirical bases for use of such procedures by less-trained professional and para-professionals using these techniques in the natural setting.

References

Cohen, H. L., Filipczak, J., Boren, J., Goding, I., Storm, R., Bishop, R. M., & Breiling, J. Academic and social behavior change in a public school setting. Silver Spring, Maryland: Institue for Behavioral Research, Inc., 1974.

Filipczak, J., & Friedman, R. M. Some controls on applied research in the public secondary school. In T. A. Brigham & A. C. Catania (Eds.), The handbook of applied behavior research: Social and Instructional processes. New York: Irvington Press/Halstead Press, 1977.

Klein, R. (Ed.). Behavior modification in educational settings. Springfield, Illinois: Charles Thomas, 1973.

Ramp, E., & Semb, G. (Eds.). Behavior analysis: Areas of research and application. Englewood Cliffs, N.J.: Prentice-Hall, 1975.

Thoresen, C. E. (Ed.). Behavior modification in education. The seventy-second year book of the National Society for the Study of Education. Chicago: National Society for the Study of Education, 1973.

Table 1

Selected Measures for Eighth and Ninth Grade Students

Measure	PREP		CONTROL		Change Score Significance
	Pre	Post	Pre	Post	
Grade Point Average	1.15	1.77	1.29	1.26	.05
Non-PREP Class Grades	1.19	1.58	1.29	1.27	.05
# Days Attendance	148.8	147.8	150.3	137.2	.05
Proportion Students Receiving Suspensions*	.80	.33	.41	.58	.06

*Based on eighth grade data only.

Figure 1

Percent of Class Attendance and Assignments Completed

and $\bar{X}$ Behavior Rating Pre-Post Reinforcement Phases